

Oct./Nov.

No. 9

\$2.00

# TS Horizons

FIRST ANNIVERSARY ISSUE

## Nine Reviews Telecommunications Column

Interview with

**Dave Higgenbottom**

"Can the Timex Computer be REBORN?"

2068 Spirograph  
Bank Switching for TS-1000 - Cont.  
Forth for Timex  
Spectrum Emulator Section  
Computer Art Contest - See page 24

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## ZX-CALC

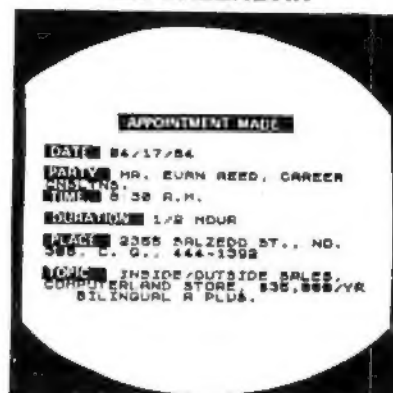


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# T-S Horizons

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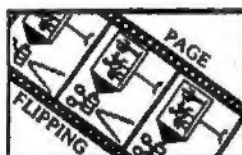
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# ENTER TSH: One Thousand

Since this issue marks the first anniversary of the publication of T-S Horizons, we are proud to announce that T-S Horizons now officially has 1,000 subscribers. In a conversation with Dave Higgenbottom earlier this month (October) I mentioned that we were near the 1,000-mark, and he requested the "honor" of being #1,000. Needless to say, I couldn't turn down an easy \$15, so I agreed. Sure enough later that week we hit the mark, and a bill for a twelve-issue subscription is now speeding its way to California.

You may wonder why the anniversary issue of a "monthly" magazine, is dated October/November and is called issue #9. As I've said many times, our goal is to publish T-S Horizons on a monthly schedule, but occasional problems occur. Advertising has been sparse, sometimes authors are late with articles but these are only part of the reason. Let's just say if we had forced upon ourselves a strict monthly schedule the quality of the magazine would have definitely suffered more than it has. So for now we'll do our best, and keep stressing that your \$15 subscription covers 12 issues no matter if our publishing schedule is stretched out a bit.



Scott Duncan  
Advertising/Circulation Manager

Richard Duncan  
Publisher

## Dave Higgenbottom

Our main article in this issue concerns the plans of Dave Higgenbottom to revive the Timex computer line. Dave has been the source of rumors for several months now, and he maybe the last hope to see the horizons of the Timex world expanded beyond the current users and available products.

Some have said that, however good they were when introduced, it's too late for the Timex computers to be successful now. But many reviewers have called the TS-2068 as good or better than the Commodore 64 (which is currently the best selling computer), and

Dave has a lot of improvements in mind. He has been talking to a portable-typewriter maker about incorporating the 2068 into a "Brother"-style machine, effectively making it a portable 2068 with a printer and a L.C.D. display built-in. The light weight Sinclair-style micro-drives would also be incorporated to make a very attractive, inexpensive portable computer. Also planned is a business-oriented version with an improved keyboard and dependable mass storage. The current model 2068 will still be available, and Dave plans to use the bank-switching, word-processing, and other capabilities of the machine to the maximum.

In Dave's plan the TS-1000 will be replaced by the 1500, which will be marketed primarily as part of an inexpensive telecommunications package, for someone who is more interested in a usable modem than a fancy computer.

You may wonder why we've held onto this interview for so long before publishing it. Tex did a great job and it is very informative. It's not that we doubt Mr. Higgenbottom's sincerity or his ability. We just wanted to wait with it until it seemed there was a good chance that it could be pulled off.

Dave has taken on a big goal and we wish him success. But Timex is notoriously difficult to deal with. In fact, they have been denying all along that they are negotiating any kind of deal for the computers. I've



He has however made a lot of progress in a past few months, and at last we feel we can print his story. Timex has made a specific commitment (details can't be released now) and Dave has been able to get significant financial backing. So keep your fingers crossed. Dave is shooting for production in early '85.

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 10. **What is the fax number of the company?**  
 The fax number of the company is

Later that week I received another phone call from him in which he said that his phone was ringing day and night because of our story about him. He also said printing his side of

In publishing Mr. Wilson's phone number, we were trying to help anyone who truly needed to get in touch with him. We do not encourage any harassment of him. We only published it because the old number which was published in Mr. Wilson's publication (the first and only issue) was disconnected and the new number was unlisted.

At this point, I have two questions for readers of T-S Horizons:

- Hope you enjoy this anniversary issue. A lot of people said it would never come. Thanks for your support. Sincerely,

**Rick Duncan**



Correction to "Worm" Word Processor for the TS-1000

As many of you who entered Gordon Young's program from T-S Horizons discovered, the program doesn't work as published. The problem occurred during the paste-up stage of the magazine when yours truly accidentally rearranged the machine code listing in issue #5. The fault was our own and Gordon Young's program works beautifully, as many of you have found out.

We tried to send corrections to everyone who wrote to us saying they had problems with it. A few people found the error and corrected the problem themselves. Chuck Peterson discovered a simple way to correct the problem and sent the following note:

"One way [to correct the program] is to re-enter all the codes in the 1 REM statement. This is horribly time consuming. A better way is to let the computer correct the problem for you. The program [enclosed] does this. Here's how to use it.

"Hopefully a reader would have the completed, but erroneous, program on tape. Load it into your Timex. Stop the program with BREAK. To that program add the lines listed in my correction. Then run the correction using the command RUN 7000. When the correction ends with the STOP code, Delete lines 7000 to 7180. Your "WORM" program is now correct and ready to use.

7000 REM WORM CORRECTION

```
7010 FAST
7020 DIM A(222)
7030 LET C=1
7040 FOR F=16850 TO 16939
7050 LET A(C)=PEEK F
7060 LET C=C+1
7070 NEXT F
7080 FOR F=16718 TO 16849
7090 LET A(C)=PEEK F
7100 LET C=C+1
7110 NEXT F
7120 LET C=1
```

```
7130 FOR F=16718 TO 16939
7140 POKE F,A(C)
7150 LET C=C+1
7160 NEXT F
7170 CLEAR
7175 SLOW
7180 STOP
```

"After doing the above my "WORM" program works perfectly. I've never had a word processor program for my ZX81. I don't know what the others are like. But I am very impressed with what Gordon Young has written. It's a great program. You have permission to print my correction in T-S Horizons. Sincerely, Chuck Peterson"

Editor's Note: As a reference we are also printing the correct code for line 1. Lines 2, 3, and 4 were correct as published. We regret any inconvenience we have caused for our readers. TSH

Correction To TS-1000 Music Program

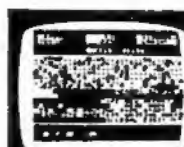
Mather White, the author of September's music-generation article, found the following minor-typographical errors (our fault). Hopefully, they did not cause a great problem for our readers.

Page 10, Driver 1, second listing in column, line 40: should be double quotes (not single)

Page 10, Driver 2, third listing in column, line 20: "(1-25)" should be "(1-225)"

Page 11, 13 lines down from top of second column: "118" should be "/18"(divided by 18)

Page 11, 17 lines from top of second column: "H" should be "it"



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## Bank Switching - - - Part 5

To start this month's instalment, we will clear up the increased RF interference on the display and discuss alternative power supplies.

### DIRECT VIDEO

There have been several articles describing how to interface a ZX81/TS1000 to a monitor instead of a TV. The advantage, of course, is the elimination of RF interference and a much sharper and steadier picture. The most useful articles have been:

|          |  |
|----------|--|
| Ciarcia  | BYTE <u>8</u> (6) June 1983 p.462        |
| Nachbaur | SYNWARE NEWS <u>1</u> (5) June 1984 p.14 |
| Pence    | COMP. & ELECTR. <u>21</u> (5) 1983 p.82  |
| Lewart   | SYNC <u>3</u> (4) 1983 p.50 & (5) p.42   |

There have been several others but in general not so useful as the four listed above. The procedure is nearly always the same. The composite video signal from pin 16 of the ULA is buffered by an NPN transistor in an emitter-follower configuration. The output is fed to the 75ohm input of the monitor (Figure 1). Ciarcia's article illustrates the use of the lower power 2N3904 transistor. Some articles discuss circuitry for the generation of inverse video.

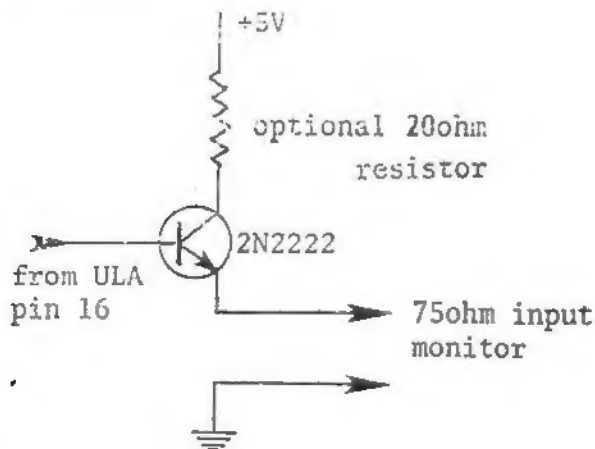


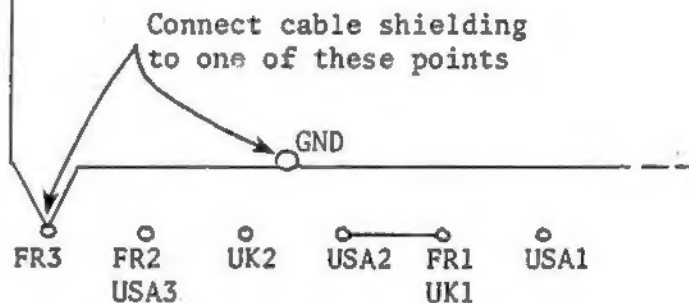
FIGURE 1

This circuit is the same as the one in Fred Nachbaur's article — you might wish to add his simple video cleanup/reverse circuit as well.

If you look inside your ZX81/TS1000 you will see next to the ASTEC RF modulator (which you can remove if you wish), a row of six holes (Figure 2).

### RF MODULATOR

FIGURE 2



The connection between the cable-shielding (ground) and the ZX81 board can be made as shown in Figure 2. The base lead of the NPN transistor is mounted in the UK2 hole, the emitter lead is soldered directly to the monitor cable, and the collector is connected via a 20ohm resistor to the USA2 or FR1/UK1 hole. The cable may be obtained from Radio-Shack (#42-2367 \$1.89). The difference in the display is remarkable. Green or amber 12" monitors can be obtained for less than \$100. (For example, K-Mart recently had the EMC monitor on sale for \$84.)

### POWER SUPPLY

By the time you connect four RAM packs, an NVM board, and a Centronics I/F, etc. to the expansion board the original power supply runs very hot, even after removing the regulator from the case and adding more effective heat sinking. So a new supply was required.



A useful approach is to build a more powerful 9-10V supply and then place separate 5V regulators on individual boards as needed. As it turned out, however, I used the original 9.75V supply for the RAM packs and built a separate well-regulated 5V 5A supply. The approach worked well enough. The 5V supply was later replaced by a surplus switching power supply from Jameco because I needed +12V and -12V as well. Jameco and many other companies often have surplus power supplies on offer at very reasonable prices. For example, B.G. Micro (P.O. Box 280298, Dallas, TX 75228) have a multivoltage switching power supply for \$37.50. Many others are advertised periodically in the popular magazines. Finally, an article by Steve Garcia in BYTE December 1983 p.36 described the use of MOV's to protect your system from transient high voltages. Considering how cheap these MOV's are, it's worth doing.

#### SOME POINTS ARISING

The COMPUTER CONTINUUM board is no longer supplied by Eric Reiter but it is available from Budget Robotics & Computing, P.O. Box 18616, Tucson, AR 85731, for \$40 post paid. The price includes the ZX81 connector.

Other buffer boards are available. An example is Kit #K2615 from Velleman UK, P.O. Box 30, St. Leonards on Sea, East Sussex TN37 7NL, UK. Alternatively, Board #84054 from Elektor, Elektor House, 10 Longport, Canterbury CT1 2BR, UK. (This is a simple board with socketing for three 74LS244, one 74LS245, one 74LS138, and one 74LS00. Connection to various peripherals is left up to you.)

If you need any extra ZX81/TS1000 CPU boards to incorporate in a banked memory system or whatever, BNF Enterprises (P.O. Box 3357, Peabody, MA 01961-3357) currently have them on sale at \$18.88.

The foil diagrams shown last month were not actual size as stated, but were reduced in reproduction.

If more banks — beyond the four catered for by the 'LS74 and 'LS139 — are required, then a quad 'LS175 with up to two 'LS138's will provide up to 16 banks of 16K each. The problem with this is, of course, that sometime or other it all has to be loaded and it is vulnerable to a system power failure. The better approach is to limit the number of banks and provide additional nonvolatile mass storage. The banked RAM can then be used to support the mass storage by providing fast access cache memory.

In Part 2, Figure 2 section 5, the BUSEN signal is input at pin 2 of the IC2 socket not the IC9 socket as stated. Normally this can be held at ground by jumpering as shown below (Figure 3). The board has been changed slightly to facilitate this. If you plan to use two processors, or require DMA, then the BUSEN signal should be derived from the BUSAK signal from the ZX81/TS1000 board by inversion.

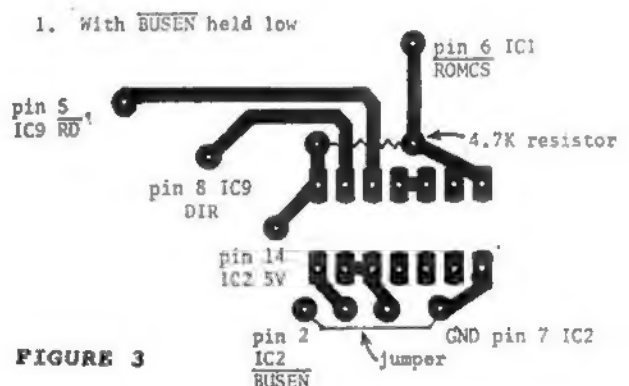
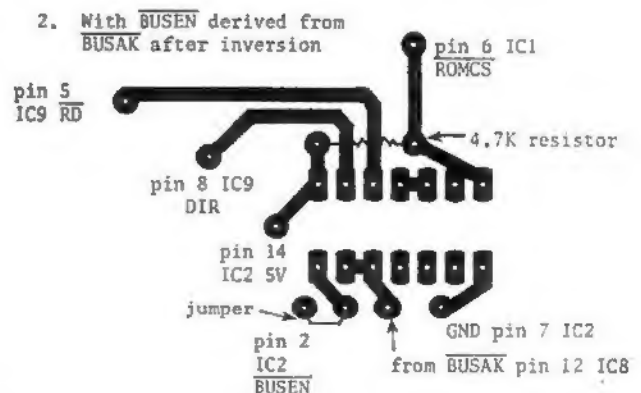


FIGURE 3



## STORING NUMBERS

In thinking about an operating system for this banked memory system, I found that at some point it was necessary to convert a decimal character string into a two-byte integer. Fortunately there are routines in the Sinclair operating system for the conversion between the different formats in which numbers are stored. See in particular the Complete ROM Disassembly by Logan and O'Hara.

Possible formats for numbers are:

INTEGER:           byte 0-255 decimal  
                    word 0-65535 decimal

FLOATING-POINT: any number between  $10^{+38}$  and  $4 \times 10^{-39}$ . Only 9-10 digits stored and only 8 displayed  
Each number occupies five bytes

STRING:           a string of character codes representing decimal digits 0 through 9

Figure 4 illustrates how to convert between the different formats using system ROM calls.

\* Actually prints the string at the current position on the screen — which can be changed using the routine at 08F5hex with the line in register B and the column in register C.

\*\* Note that since the result is in the register pair BC, the result can be displayed by using the command PRINT USR ...

## ADDRESSES

| Routine   | hex  | decimal |     |      |
|-----------|------|---------|-----|------|
|           |      | MSB     | LSB |      |
| STACK-A   | 151D | 21      | 29  | 5405 |
| STACK-BC  | 1520 | 21      | 32  | 5408 |
| STK-TO-A  | 0C02 | 12      | 2   | 3074 |
| FIND-INT  | 0EA7 | 14      | 167 | 3751 |
| PRINT-FP  | 15DB | 21      | 219 | 5595 |
| DEC-TO-FP | 14D9 | 20      | 217 | 5337 |

Try the following two examples to illustrate the use of these routines:

### EXAMPLE 1

In this example a two-byte word will be moved to the calculator stack and then printed. The two bytes 35 (MSB) and 40 (LSB) represent the number 9000 (i.e.  $35 \times 256 + 40 = 9000$ ).

Store the two bytes in a REM statement at 16514 and 16515. First enter a REM statement at line 10 with any two characters following the REM. Then:

POKE 16514, 40  
POKE 16515, 35

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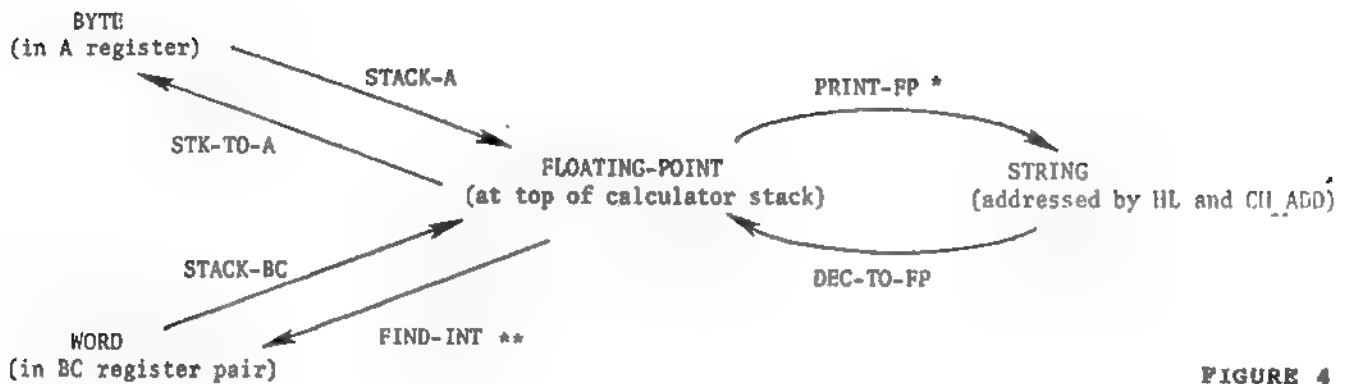


FIGURE 4

## "Bits & Bytes" No. 2

By Bill Ferrebee  
MOUNTAINEER SOFTWARE

Hello again. We're back with "everything you didn't know, and may not care about"! But you're getting it anyway!

I'm getting a great response from the User Groups around the country, and even from CANADA! If you haven't sent me info on your group, what are you waiting for!!? I am putting the list on the RIVER CITIES SMART BBS (see ad in this issue), and am compiling a list for a future issue of T-S Horizons.

Also, please put me on the mailing list to get your group newsletter, if you publish one. I plan to dedicate a section of this column to a "T/S User Group of the Month". If you want to be in contention, make sure I hear from you!

Make sure you check out the T-S HORIZONS/Games to Learn By "Art Show" contest elsewhere in this issue. If you haven't already gotten ART FOR ALL AGES, get it! Send us your best work with the program, and you may become a winner in our first contest.

Notice I said FIRST contest...I have already gotten the next one ready...keep watching!!!

With the holidays approaching, I am interested in seeing your best Christmas programs for T/S computers. Send me you programs, and we will share the best in the December issue.

In the January issue, I will be doing a comprehensive look at Word Processing programs for the TS2068. If you have a WP program, and want to be included in the article, send me a copy for review.

In closing, I appreciate hearing from you. Comments and suggestions are always welcome. My address is:

Bill Ferrebee  
MOUNTAINEER SOFTWARE  
115 North 7th Avenue  
Paden City, West Virginia 26159

Until next month, take care and ENJOY LIFE!!!

## Rebirth of the Timex Computer?

INTERVIEW - Dave Higgenbottom

By: Tex Faucette

Dave Higgenbottom has hopes of "reviving" the TIMEX computer line. After hearing this rumor (in at least forty different formats) for several weeks, I was able to contact Mr. Higgenbottom by telephone for the following interview taped on June 18th.

Tex: Do you actually have the rights for TIMEX?

Dave: No, we are presently negotiating for them, in fact, we are working on the final draft of the business plan which we hope to submit to Timex by the end of the week.

Tex: Good, I guess that's progress!

Dave: Well, as it is there are about 55 companies that have agreed "in principle" to merge together...

Tex: HOW MANY?

Dave: Fifty-five!

Tex: Hey, this is getting more intriguing by the moment! Would you elucidate a bit?

Dave: Essentially what we came up with was a way of acquiring the rights and being able to put forth a nation-wide marketing company. I went out and started contacting a lot of small companies that all serviced the TIMEX field, and presented them with the basic question, "What were they going to do now that TIMEX has stopped production?". And how would they like to get together as a single company, a publicly held company, and not only be able to produce their product; but to have the rights for the computers as well. All of this has happened within the last 80 days or so.

Tex: Well, things move fast in the computer world.

Dave: I'm trying to move them very fast. As you can appreciate, there's an immense amount of paper work that has to be accomplished. What we will have is the basis of a "Marketing Co-op".

Tex: Well, that sounds good. Except for one Hastings Book Store in this area, I haven't seen any real effort to market the TIMEX. I sometimes wonder if there is a real salesman left in the world!

Dave: Imagine, if you will, a National, even, International chain of DEDICATED computer stores under the name of, "THE LITTLE COMPUTER STORE". It would have the products of all the member companies as well as products not necessarily associated with member companies, but also specifically related to TIMEX. The new computer when it comes out will be called, "TIMESTAR, The Timeless Little Computer".

Tex: Now will this include producing the "1000", "1500" as well as the "2068"?

Dave: The "1500", yes, the "1000", possibly not as it was essentially superseded by the 1500. As of the Memorial Day weekend I was able to contact 10 people of the original TIMEX design team, and they have all virtually agreed to come back together. So we will have some of the original product design team.

Tex: So you can take the 2068 on into areas that TIMEX had announced or hinted at: bank switching memory expansion, that kind of goodies?

Dave: In fact, the person who holds the bank-switching rights is one of those people. Tex: Dave, can we call any names at this point?

Dave: At their request, no. You will find that I will be very free with information except where people have asked me not to. We have a little news "blip" that hasn't been able to get out into the major area. I can read it to you...

Tex: Tape rollin, go ahead!

Dave: Essentially, this was the original news release we came up with, and it was dated 3/14/84:

"T/S COMPUTERS TO BE BORN AGAIN? How many of you have asked or been asked this question, "Is the T/S computer dead?". The answer is no, we repeat, No! A thousand times, yea, 1500 times, yea, 2068 times NO. They are not even dying, they are just growing up. A metamorphosis is about to happen, one which may really shake things up. Following the formal announcement by the TIMEX Corporation regarding its withdrawal from the retail computer market, a multifaceted plan has been revealed by Trinity Magnum, a California company, to re-vamp and strengthen the T/S 1500-2068 market previously established by the TIMEX Corporation. The total re-structuring of distribution and marketing emphasis is foremost in this proposal. Nationwide support involving hardware manufacturers, software producers, and other interested individuals or companies related to the support of the T/S computers is seen at this time, and is growing daily at an astonishing rate. Plans include aggressively supporting the educational market with a complete systems approach, not only with peripherals and software heretofore only hoped for, even disk drives, full-size printers, expansion busses, and much, much more, all of which are already in production. Also high quality sophisticated courseware geared to individual subjects, as well as primary computer training. System sales, in-service training, user support, monthly publications and books, along with product maintenance and insurance will be offered. As part of the package, classroom networking as well as full system-wide interfacing will



be stressed. In addition, a nation-wide chain of retail stores under the name of, "The Little Computer Stores" will be established, dedicated exclusively to the continued support and development of T/S compatible hardware, software and accessories. All items to be marketed will be of the highest quality, and fully warranted. Hardware/software demonstrations of any product will be offered. Stores will be operated as partnerships between individuals or companies and Trinity Magnum. A complete support system for the little computer and you, the dedicated user, will be the end result. No, folks, the T/S story is not ending here, only just beginning. Look for much more future life to come to your little computer system. Manufacturers or suppliers who want further information should contact David Higgenbottom at Trinity Magnum, (213) 864-7068."

Dave: Now that's what was to go into SYNC...

Tex: AHA! And SYNC quit before they got around to publishing it!

Dave: And SYNC pulled the plug.

Tex: Yeah, I was one of those subscribers who got a choice of either of two magazines to fill out my unexpired subscription. I think they were extremely short-sighted on that. They completely ignored the thousands...I won't say millions because I really don't know...

Dave: They had a hundred thousand subscriber, roughly, I don't know, maybe 85 to 90 thousand.

Tex: Well now, Dave, can you honestly tell me that you are making real good progress here, and that we are going to see this?

Dave: I'm sitting here with one of the other fellows I have chosen as a partner, and he's finishing up the business plan right in front of me...see, we already have a public company down in San Diego, California that has agreed to subordinate about two million shares out of 3.9 million and change its name to Trinity Magnum and to be the acquisition vehicle from which these other companies will come in. I spoke to a person this morning who may put in a minimum of \$250,000 into the project, and I've got some other friends who will be able to come in for a bit more than that...

Tex: Am I reading you right that these stores are going to be more or less a franchise type...

Dave: No, a quasi-franchise, they will actually be limited partnerships between the owner-operators and Trinity Magnum, Trinity Magnum becoming the limited partner and they becoming the general partner, of each store. That way, we can actually support the price. That was one of the problems TIMEX had, they went down the street and sold their computer to everybody and said, "Here. You guys go fight."

Tex: Maybe that was why nobody was pushing the things.

(At this point we discussed a sampling of suppliers, programmers, etc.)

Dave: One of the wild things that's out there, there's a tremendous amount of ingenuity and engineering talent. What I propose to do is basically have these people start complementing each other, rather than competing against each other. The concept of Trinity Magnum is that when Timex pulled the rug out from under, these companies were going nowhere except down. And what I am trying to do is build an ark big enough and fast enough...to give them as much independent control of their companies as possible, but go out with the combined financial resources of all these companies...you know how a dairy co-op works? O.K., now imagine Trinity Magnum would wind up having 50% of the co-op. Now each one of these little companies would now come in and Trinity Magnum would make an offer to acquire their assets for stock in Trinity Magnum. Now that gives Trinity Magnum, to the financial world, the combined financial resources of all these 100 "farmers". And each "farmer" will sell his product to the co-op at a profit. The co-op in turn will market it, package it, get it ready for distribution to a major market like, say "Carnation", which in this case happens to be The Little Computer Store. The co-op then would sell at a profit, and the money coming back would pay to run the co-op, packaging, transportation, etc., and what is left over would revert back to the individual shareholders of the co-op. How the companies will benefit is that they, in fact, will have ownership in Trinity Magnum, so they not only get their shares back for a dollar volume related directly in the co-op, they also get it back in long-term tax deferred income by virtue of their ownership in Trinity Magnum.

Tex: Will you carry the co-op concept on into the purchasing area?

Dave: What we are talking about now is purchasing 10,000 computers at a time from Timex. They will continue to manufacture them, only under the TIMESTAR label, they will be manufactured exclusively for us, as we will in fact have the rights to them. Now imagine being able to go out and order 10,000 or 50,000 disk drives at a time. Imagine user groups interrelated to the Little Computer Stores, walk in to the Little Computer Stores and have any hardware or software demonstrated prior to purchase. You would wind up having the stores support the user groups in their area, in fact the user groups could hold stock in the store.

Tex: One more crucial question, Dave, and I'll let you go. When and where can we expect to see the first "LITTLE COMPUTER STORE"

Dave: I would like to see it in September. As for where, well, I have had 12 people stand up and want 18 stores, so...we envision between 2500 and 7000 stores; all across the area we will hold the rights to when we get through.

Tex: What size city will you be targeting?

Dave: Wherever anybody wants a computer. A good rule of thumb is anywhere there's a McDonalds, we'll put a store. The stores will cost between \$25,000 and \$50,000 a whack, and most of that will be going into products. There isn't going to be any kind of a franchise fee.

\* \* \* \*

So that's the Dave Higgenbottom story as of June 18, 1984. That wasn't the whole conversation; Dave has plans for advanced models, expanded models, portable models, full use of the front port, in short, all the things Timex should have progressed to. It is a very ambitious undertaking, and if he pulls it off it should open up all kinds of opportunities.

Mailing address for Trinity Magnum is 10614 Roseton, Santa Fe Springs, CA 90670. Dave would especially like to hear from Charles Bride, believed to be somewhere in Massachusetts, also Huron Valley Research, somewhere in Michigan.

And tell them you read it in T-S HORIZONS.

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Note: 2068 versions are more than just "uploads", but are remakes containing full color and sound.

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## FORTH for the 2068

By Tex Faucette

Everyone should try FORTH. I am unaware of the exact ratio, but a certain percentage of those who try it will like it, and the rest will hate it. There seems to be no middle ground. I recently read (I don't remember where) a statement of the number of active FORTH programmers which indicated that a rather exclusive society exists when compared to active programmers in almost any other computer language.

The fact is, FORTH systems are available for everything from the Timex-Sinclair machines on up to the top of the price scale. In addition to two new packages for the 2068, "XFORTH" for the T/S 1000 has been available for quite some time. HAWG WILD SOFTWARE (P.O.Box 7668, Little Rock, Arkansas 72217) introduced the program, and shortly thereafter began publication of "XFORTH EXCHANGE". "XFORTH EXCHANGE" is a rather exclusive (and free) newsletter available ONLY to those who purchase any FORTH package from HAWG WILD. It is not available to others at any price.

"XFORTH" is a FORTH-79 sub-set, which has been adapted to utilize the Timex limited character set. The manual is rather sketchy for a beginner, but for an experienced FORTH programmer the only limitation is the available memory.

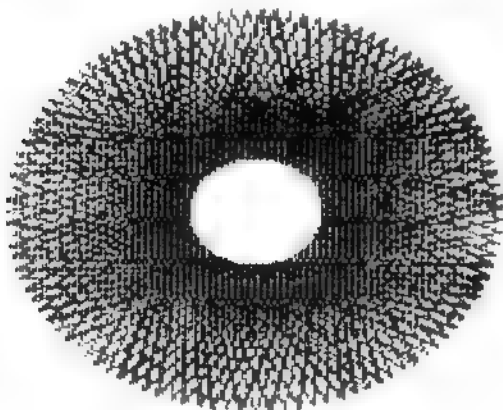
2068 FIG-FORTH is a much more elaborate "kernal" by E.A. Worden. It also includes a standard (16 line by 64 character per) "Editor" which is explained in a special section of the manual by Bill Stoddart of FIG, United Kingdom. I believe the user will find this FORTH to be much easier to master, using the recommended tutorial textbooks (Brodie, Scanlon, et al). A few nonstandard "words" are already installed, such as "TAPE-SAVE", "SCR-SAVE", "SCR-LOAD", and "BYE" (which returns one to Basic).

"ABERSOFT FORTH FOR TIMEX T-S 2068" is another "FIG", by John Jones-Steele. I found this particular FORTH to be quite fascinating, in that it contains a "RAM disc" scheme in anticipation of the projected "MICRO-DRIVES". (Where are you, David H.?) It also contains major extensions that use familiar words such as "INK", "PAPER", "PLOT", "DRAW", etc. "LINK" ties the screen and printer together so that anything input to the screen is also printed on the ZX printer. (I have not tried this one yet, if it works on the Timex printer it could be very useful in a FORTH communications program for downloads!) "UDG" (User Defined Graphics) is also included, with directions as to how to design special characters given in the manual.

Both of the 2068 FORTH programs described have the option for a "warm start" which will preserve any "words" the user has added to the vocabulary but not yet committed to tape or disk.

Both 2068 programs have very good user manuals, which I anticipate will be supplemented by future issues of HAWG WILD SOFTWARES "XFORH XCHANGE". And I would urge all users of these programs to utilize that medium, along with T-S HORIZONS, to share their experiences and "words" with all of us.

(Editor's Note: All the FORTH software mentioned above are available from Hawg Wild Software. See above for address.) TSH



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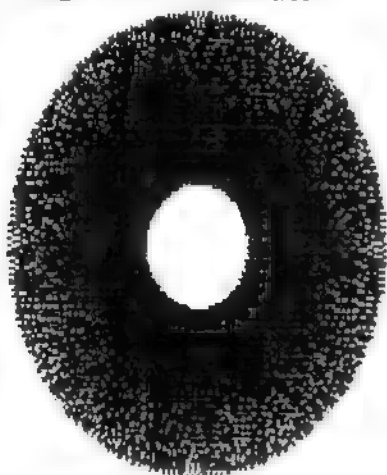
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Texans add local tax

The following note accompanied this month's tape from T.S. Services (formerly known as T.S.T.I.S. - See T.S. News section for more details).

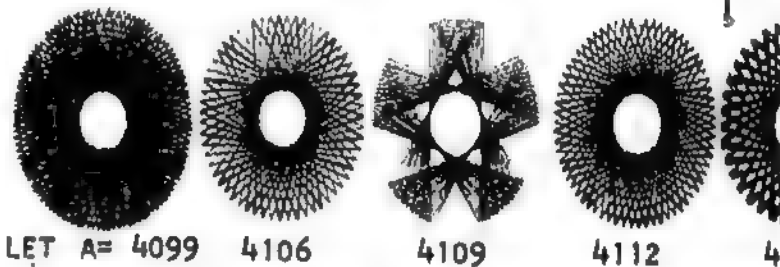
2068 "SPIROG

"Here is a cute routine to show your friends  
PLOT 68,28:DRAW 100,100,4100."

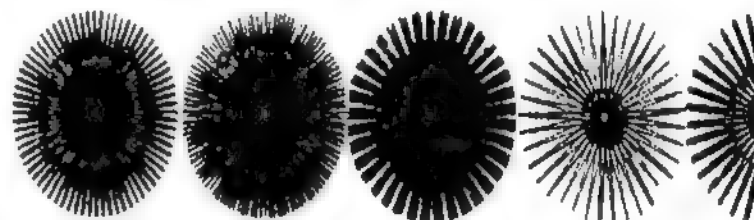
At first glance you might expect that this program would not work because of the large third number in the DRAW Statement. But if you try it you'll find that it does more than draw an arc, as the DRAW command is intended to do. It very quickly draws a pattern of lines and produces the following figure. (1) It is circular on your TV screen but the 2040 printer elongates it somewhat.



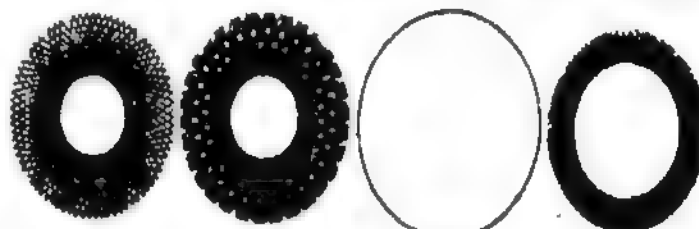
5 LET A=4099  
10 PLOT 68,28:DRAW 100,100,A



LET A= 4099    4106    4109    4112    4



LET A=3936.4    3936.6    3936.9    3937    39



LET A=20002.5    20003    30000    40002

## 2068 SOFTWARE REVIEW

By Tex Faucette

### USER DESIGN GRAPHICS

By Andrew J. Jackson

(C) HAWG WILD SOFTWARE, P.O. Box 7668, Little Rock, Arkansas 72217

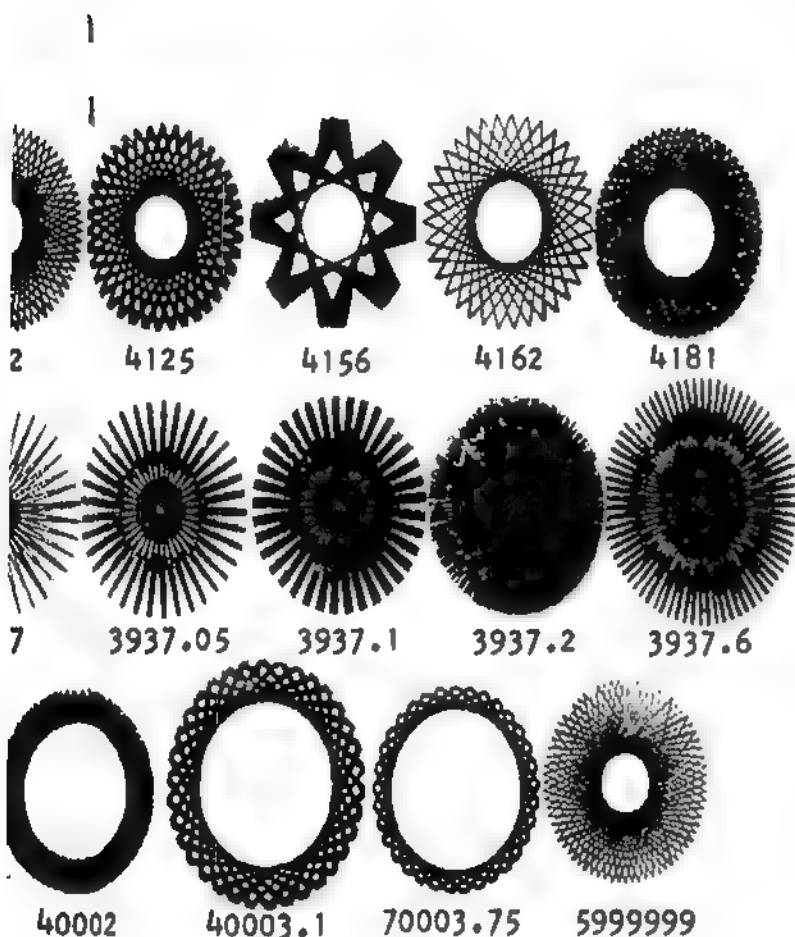
USER DESIGN GRAPHICS is a neat way to design your own characters for use in games or whatever. The program selfstarts, presenting

the user with a menu that includes a "tutorial" option. This should be selected by the first-time user. It runs through the whole routine of designing a special character, with on-screen narrative. When this demonstration is completed, one has the option of repeating the demo or getting down to the business of designing the desired characters.

The new character is designed in the lower right portion of the screen by entering 1s and 0s to produce the desired figure. When the figure is completed, the user must confirm that it is correct. If a mistake has



# SPIROGRAPH



Numbers other than 4100 will work in the DRAW command, but about 80% of the numbers we tried returned an error message. Some of the more interesting patterns for the numbers from 4100 to 4200 are pictured below. (Fig. 2. This and the following figures are reduced).

Even fractional numbers produce their own unique designs. For example 3936.4 to 3937.6. (Fig. 3)

There doesn't seem to be a limit to how large a number can be used, either. (Fig. 4)

Other ways to modify the design are to change the starting point (PLOT parameters) or increase or decrease the diameter (the first two DRAW parameters). For some of the patterns printed here, these parameters had to be changed to keep the picture on the screen.

Perhaps eventually some mathematician or machine code programmer can determine a formula to find the numbers that give good results. In the meantime, the rest of us can just use it to impress our friends and in graphics programs.

been made, it can be corrected before the figure is committed to memory. The figures created are displayed in the upper left portion of the screen in the size they will actually appear. Larger figures, of course, may be constructed in segments and combined under control of the program they are to be used in. To produce a form of animation in such programs, one could create several aspects of the same character to be displayed in sequence.

Another menu option allows viewing of the characters already created. Once created, characters may also be saved on tape and

reloaded later, and of course they remain in memory until over-written or the machine is turned off.

In using this program I discovered that in the design mode the program will accept decimal data as well as binary. This can be a great time saver, as entry of a 0 will produce a blank line, 255 will produce a solid line. Quite a few published programs give the data strings in decimal, so if you want to copy someone else's characters, just enter the decimal strings from the published program!

TSH

## 2068 SOFTWARE REVIEW

By Gordon Young

I had hopes of getting more done on the 2068 machine code routines I was working on but having taken my summer vacation this month, I am a bit behind on just about everything. Thanks to the many users who have written me about the WORM word processor program and hope everyone gets all the machine codes entered all right. Like most of you, I am STILL waiting for my 2068 technical manual for the machine and hope to get information on ROM routines available. If this information was shared better than it is, more good software would evolve, and we need it!

Yesterday I received a stringy floppy (the one from CAI) for the TS-1000. I can certainly say that having used this for only a day, that I am impressed. Most of my programs take at least 3 minutes to load and even though my cassette yields good loads, the stringy loads in seconds perfectly. More on that later. A number of outfits have been contacted in my plight for BBS software to run on the 2068 or 1000. Byte Back was good to provide the source code for their MODEM so that I could write my own but this will take some time to complete. A very good mini BBS can be operated on the 2068 since it has so much memory, and even the TS 1000 could be coupled with the 64K to do the job. Or, how about a mini system to run with the stringy floppy! I am quite surprised that no one has developed the software to do this yet. Maybe one of the readers will have a tidbit to help me get going.

If you are wanting to use the 2068 with a full size printer, I have some promising news. From Paul Hunters articles I learned how to devise an input/output port. It is just what I needed to let the computer send data to the Radio Shack USART chip I was playing with. So far, I have initially tested the RS 232 design I am working on and

it is sending the bits out on a line to the printer just as I wanted. When the - 5V circuit is added, I will provide you all with an article on it. You will be able to use this on either the 2068 or the 1000. So I am still very busy!

### "ZEUS" ASSEMBLER

Now, for the real portion of this article. I have seen and tried a great many assemblers for the 1000 and they are still sitting in a drawer somewhere. But, there has been no piece of software to come along quite like the one from SOFTSYNC. "ZEUS" is an assembler which I think was written in Britain. If you program in machine language, get your order in immediately! Forget inserting the mnemonics in stupid REM lines. "ZEUS" is as good an assembler as the highly expensive one for the APPLE. I have used it to write routines and I vow never again to spend hours handwriting a machine program again. "ZEUS" loads very quickly on the TS 2068 and has 2 modes: assembler/monitor. To assemble a routine, simply write a line number, the mnemonic and thats it. If you wish to use a label or literal, no problem. This is what I really like...I write a routine within the machine code program that performs some specific task (like print to the screen). Instead of saying JP to an address, I just say JP PRINTSCRN or whatever label I give it. Should I decide to use an address to hold certain information and dislike referring to a number all the time, I can give it a name. In doing so, I define it in the beginning: SCRNADD EQU 37500 (meaning to let address 37500 be used every time I refer to a name called SCRNADD [Screen Address]). You can write in optional comments for the lines you write (like using REM lines for notes). ZEUS also handles expressions and operators. Right now you should be getting the impression that this program is a MUST! The ZEUS user can add to or subtract from his program as easy as BASIC and when everything looks right, you simply press "A" to assem-

ble. 1  
takes 4  
your p

The mo  
the as  
copy i  
HEX/DEC

can get  
routine  
found c  
the li  
hot dog

It took  
feel fo  
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definit  
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might  
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excellen  
entire  
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81/TS :  
introdu  
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It is t  
TS 206  
Recentl  
10X pri

ble. Any errors are quickly noted. It only takes a second for ZEUS to assemble and check your program.

The monitor portion allows you to dig into the assembled programs to check things out, copy it to another area in memory, convert HEX/DECIMAL, modify and more. With ZEUS you can get a printout on the 2040, execute your routine and do many of the high class things found only on expensive assemblers for top of the line computers. This program is a real hot dog.

It took me about 3 or 4 hours to really get a feel for it, but I would rather fight than switch to anything else! I rate this one a definite 10. Price: \$19.95 (the last time I looked) form SOFTSYNC. Although a beginner might get lost with an assembler of this caliber, a seasoned user will appreciate its abilities. If only I could write such powerful programs!

#### HARDWARE REVIEW-TS2068

By Larry Biederman

Centronics Printer Interface  
AERCO, Acme Electric Robot Company  
Box 18993  
Austin, Texas 78760

The untimely demise of Timex as a computer company left the American Sinclair computer owner in a real pickle. Fortunately, Sinclair has always encouraged the after market producers of software and peripherals. A number of these barnstormers in computer excellence have continued to support the entire line of TS computers. Of special note is AERCO. AERCO produced a line of printer and disk drive interface cables for the ZX 81/TS 1000, 1500 computers. They have now introduced a printer interface and project the introduction of a disk drive interface for the TS 2068.

It is this type of interface which allows the TS 2068 to utilize its full potential. Recently, I connected my 2068 to my Gemini 10X printer using the AERCO interface. The

cable connection took only a moment. My next step was to customize my programs for use with the printer. This proved far more difficult. AERCO has a simple and very user friendly method for customizing programs for use with the 10X. All one needs to do is: 1. Enter the printer driver software; 2. Do the customize routine; 3. Do the printer test routine. No problems with the 10X; 4. Do the load routine and enter your regular program.

From this point on, you proceed normally using your program and utilizing your printer for output. If you wish, the program has provisions for entering the program line of your Timex programs in order that you might further customize the program or save it on another tape.

All and all this is a well thought out system. Unfortunately, AERCO didn't spend enough time on their documentation of their printer driver software to let you know what a good job they have done. Instead, they used the "hieroglyphic" system of documentation. The consequence. It took me two days of trial and error to figure out what they should have said up front and from the beginning.

TSH

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## Art for all ages

By Bill Ferrebee

Program name: Art for All Ages  
Author: Robert E. Conlon  
Type: Educational/Entertainment  
Machine: TS2068  
Price: \$15.95  
Available from: Games to Learn By, P.O.Box  
78, 28 Claire Hill Road, Collinsville,  
Connecticut 06022

Last month we explored the world of music through the program MUSICOLA for the TS2068. This month we continue our journey through the "Computer Cultural Corner" with a look at another program that allows us to express our artistic tendencies.

ART FOR ALL AGES is a program for the TS2068 that allows you to turn your TV or monitor into a "Computer Canvas". This program can enable you to create pictures as simple as a block drawing house, or as complex as any fine painting. A good example of how complex your picture may be is the cover sheet that is generated when you load ART FOR ALL AGES. You will feel as if you own a piece of The Louvre in Paris, because a very realistic drawing of the Mona Lisa appears. Of course, something this complex will take some time to

create, but you can begin drawing very nice pictures almost immediately. A demonstration tutorial has been included to show you how to operate this program. By the time you finish the tutorial, you will have become familiar with most of the commands, and you will have drawn your first masterpiece.

Even if you can't draw a straight line, you can share your artistic tendencies with this program. (And if you send us your best picture, you just might win your first "Art Show"! See the adjoining article for more information.)

The Instruction Manual included with ART FOR ALL AGES is very complete and well written. It includes two keyboard layout charts, to help you find the appropriate keys for each command and the 29 Predefined Graphic keys. Each command available in the program is well explained, and prompts appear on the screen to further help you while you create your "Masterpiece". For those of you that would like to give your kids a chance to explore the "World of Art", there is a simplified versions of this program, ART FOR KIDS, that will satisfy their needs. In closing, I feel that Mr. Conlon has done a fine job in creating this program, and I recommend it to all aspiring DiVincis and Piccasos. TSH





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# The First Annual T-S HORIZONS/Games to Learn By "ART SHOW"

Send us your favorite picture done using ART FOR ALL ABES.  
If it is selected by the judges as one of the 3 best submitted,  
you will be awarded a Gift Certificate from Games to Learn By  
towards any product in their catalog!

Your picture can be of anything you like (as long as it  
isn't obscene!). It can be a portrait, still life, modern  
art...YOU pick the subject.

Three prizes will be awarded:  
1st Prize : \$25.00 Gift Certificate from  
Games to Learn By  
2nd Prize : \$15.00 Gift Certificate  
3rd Prize : \$10.00 Gift Certificate

Now, you have your chance to be creative and maybe even win  
a prize at the same time! Send your entry today!

## The RULES

- 1) This contest is open to anyone in the United States or Canada  
except employees of T-S HORIZONS or Games to Learn By.
- 2) To enter, create a picture with the program ART FOR ALL ABES,  
available from  
Games to Learn By  
P.O. Box 78  
28 Claire Hill Road  
Collinsville, CT 06022
- 3) After finishing your picture, save it to a blank cassette  
tape, as per the instructions in the program Instruction  
Manual. Label the tape with the title of your submission, and  
your name, address, and telephone number.  
If you would like your submission to be returned after the  
contest, enclose a stamped, self-addressed envelope with your  
submission. Make sure to enclose sufficient return postage.
- 4) Send your entry to:  
Bill Ferree  
Attn: Art Show  
115 North 7th Avenue  
Paden City, WV 26159
- 5) All entries must be postmarked no later than December 1, 1984  
and recieved by the judges no later than December 7, 1984.
- 6) The judges will select three (3) winners from those entries  
submitted.  
Prizes will be awarded as follows:  
1st Prize : \$25.00 Gift Certificate  
2nd Prize : \$15.00 Gift Certificate  
3rd Prize : \$10.00 Gift Certificate  
Winners will be notified by telephone no later than December  
15, 1984, and the names of the winners will be published in  
the January issue of T-S HORIZONS.
- 7) In submitting an entry into this contest, the entrant gives  
T-S HORIZONS permission to print their entry in the magazine  
if they so wish to.
- 8) The decisions of the judges is final.

# Mountain Software

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P.S. When you call, leave me a message, in care of  
TIMEX SYSOP!

# In Touch With The World No. 3

By Bill Ferrebee Mountaineer Software

Welcome again to the column, and this month I will "shift gears in midstream", so to say. Originally I had planned to review the new SMART II software for the Westridge 2050 modem. Anchor finally released it, and many of you may already have it.

I was promised a review copy of SMART II from Anchor the day it was shipped to the dealers. However, as I am writing this column, that was over THREE weeks ago, and I still have not received my copy!

To make matters worse, I am receiving numerous calls, letters, and messages on the RIVER CITIES SMART BBS, asking for an explanation on how to use the Upload and Download features of the software. It seems that the Instruction Manual included with SMART II lightly brushes over what I feel is the most important feature of the program. I have been in contact with whom I feel are the most knowledgeable people on the T/S, and none of them have been able to get it to work, either.

This brings me to two conclusions on this subject: 1) I hope that Anchor recognizes this oversight, and will remedy the problem of the explanation of how to use the UL/DL in SMART II, and they will see clear to allow me to review the program as they promised. 2) I hope that someone will find the solution in the meantime, and will get in contact with me so that I can share the answer with everyone else.

Enough for now on that subject. I want to tell you about a few sources you can contact with your modem, and these will not put a strain on your long-distance telephone bill, because they are TOLL-FREE!!! You got it, through the magic of "800" numbers, you can telecommunicate across the country for free (or almost).

The first source is MCI Mail. The same guys that are saving you \$\$ on long-distance phone calls are at it again. This time you are able to send Instant Letters electronically anywhere in the country for almost nothing (your first letter IS free!), and you pay only for the letters you send. No membership fee, no minimum, TOLL-FREE calling, and it includes a FREE membership to Dow Jones News/Retrieval (a \$75.00 value).

If you want more information on MCI Mail, call TOLL-FREE (voice) 1-800-624-2255.

The other TOLL-FREE number is a National BBS called ONLINE. Based near Atlanta, ONLINE provides free online newsletters and product information for numerous brands of computers, including Timex/Sinclair. John Murray, owner of ONLINE, has told me that he already has a big contingent of T/S users. Let's show him we're ALL behind him!!!

The board is now open Monday-Thursday from 6 p.m. - 1 a.m. Eastern Time, and from 6 p.m. Friday - 6 a.m. Sunday. John assures me that by the first of the year he expects to extend the hours on weekdays.

The number for ONLINE is 1-800-438-2438, outside of Georgia. Be sure to check out the T/S newsletter...you should recognize the editor!!!

Well, that's it for another month. If you know of any BBSs that have a T/S SIG, let me know. I will give the board the exposure it deserves. Also, keep those cards and letters coming!

My address is:

Bill Ferrebee

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## Hardware Reviews for the T-S 1000

by Doug Gangi

### Q-SAVE

#### Order from:

Intercomputer Inc.  
358 Chestnut Hill Avenue  
Boston, Mass 02416  
(617) 738-5310

Q-SAVE is a speedy loader device for the TS 1000/ZX81. It can load a 16K program in about 25 seconds (compared to 6 minutes with the normal loading time...that's quite a difference). Q-SAVE is a hardware/software combination. The hardware supplied is a filter/amplifier. It greatly increases the chances of a load (with a Q-SAVE program or normally). The software is what makes the Q-SAVE save and load so fast. It comes in 16k and 64k formats. With a "PRINT USR" call, Q-SAVE is activated. For example (16k version): PRINT USR 32383...is the Q-SAVE save command. Q-SAVE is very handy in saving long programs. If you never play a game because it takes so long to load and you just never want to bother, then Q-SAVE is for you. It is also great for saving long files or records. A few problems with Q-SAVE is that you can't use the printer. If you try a COPY, you get an error code. Another problem is that some of the older tape recorders do not work that well with Q-SAVE. Tape volume is also very important.

But a great feature to make up for all this is the VERIFY facility. It acts as a regular LOAD command, but tells you if the program is a good LOAD or not, and if not, then you can always reSAVE it, rather than finding out later that you have a bum program.

All in all, I really like my Q-SAVE. I usually use it only on long programs, since it would take just as long to load the Q-SAVE

software then the Q-SAVE program than it would take to load the regular short program. Q-SAVE is a remarkable device, and there are many other devices like it, but Q-SAVE is the cheapest and most popular. Q-SAVE is a must for all of you serious programmers (and people who hate waiting 5 minutes to LOAD a program).

### The Zebra Talker Speech Synthesizer

#### Order from:

Zebra Systems  
78-06 Jamaica Avenue  
Woodhaven, New York 11421  
\$59.95 plus \$3.00 postage and handling

The Zebra Talker is an excellent choice for a speech synthesizer. It has very good sound for an under \$100 dollar speech synthesizer, and is very easy to program. It has no software to operate it, because it comes with it's own little eeprom that just plugs into the port of the TS 1000/ZX81. With a speech synthesizer, you can add some reality to your programs (Quizzes could be spoken, not just printed on the screen!). I have found that a speech synthesizer shows off the Timex more than any other peripheral that I have. Everybody that I show it too is very startled that a computer is actually speaking to them. A speech synthesizer does show what the little TS 1000/ZX81 can do. I would recommend a speech synthesizer to everybody. Your kids will get a kick out of it, and so will you.

If you need a speaker then add \$12.50 or you can go out and buy one from your nearest Radio Shack Store (ask for their "MINI AMPLIFIER").

# SPECTRUM SECTION

The Timex 2068 is based on the English ZX Spectrum computer, which is very popular in throughout Europe. Tons of excellent software is available for the Spectrum, yet very little of it will run on the 2068 due to design changes made by Timex.

With the proliferation of Spectrum emulators and ROM chips, more and more American 2068 users are becoming 2068/Spectrum users. Doug Gangi has provided a list of programming tips that work on his converted 2068 and reviews of "3D-Tanx" and "Ant Attack." We've heard that the latter has become wildly popular in England.

Elsewhere in this issue is a review, by C. Hewitt that will tell you what you can expect when you get a Spectrum ROM replacement chip. Some people however may not like the idea of inserting and removing chips too well.

Fortunately there are less drastic solutions also available.

- G. Russell Electronics offers a kit that can be permanently mounted inside the case of the computer itself, and can switch the computer between Spectrum and 2068 modes by an external magnetic switch. It costs \$54.95 from G.R.E., RD 1, Box 539, Centre Hall, Pennsylvania 16828.

- Doug Dewey of the Traingle Sinclair User Group has developed the "Chameleon" - a simple way to run an estimated 95-98% of all Spectrum software on the 2068. This does not require opening the computer, or any special software. For more information write to Doug, 206 James Street, Carrboro, North Carolina 27510. Phone 919/929-3079. The cost is \$60.

## 3D Tanx (DK'Tronics)

If you are the type of person who likes the shoot-'em-up games, then you'll love 3D Tanx. The graphics are very good, and the game is very addictive.

Your point of view in the game is a tank in the foreground (you can only see your turret) and there is a bridge in the middle of the screen with a street in the background. The street is divided into 4 lanes, each of which has an enemy tank. You can either raise or lower your gun to hit him. If you only hit the tank indirectly, the turret of the tank will still be able to function (and shoot at you!!). The only way to destroy the turret is by a direct hit. This will leave the tank looking like a crumpled mess. It takes only 1 hit by the enemy tanks to blow your tank up and end the game.

Since the Spectrum ROM is not set up to use the joystick ports, you can only use the keyboard. In 3D-Tanx, you can select the keys to suit your preference. There is also a key that pauses the game (if you need to make a quick shot to the refrigerator!). The price of 3D-Tanx is somewhere around 6 pounds (about 8½ dollars American money).

## Ant Attack (Quicksilva)

Ant Attack is a super 3D game for the Spectrum. It really shows off the graphic capabilities of the machine.

The object of Ant Attack is to enter a 3D maze (seen originally from a diagonal above the maze, like "Zaxxon"), and rescue a girl (if you are a boy), or a boy (if you are a girl). It may sound easy, but it is not. There are many hungry ants roaming the maze looking for people to eat. Your only defense is a bomb of insecticide which you can throw at the ants. You can also jump onto an ant and paralyze him. Your person can jump to various levels (but the ants can only stay on the ground). If you run behind a tall wall and can't see yourself, you can change the 'perspective' of the view. Sometimes it is very difficult to stay alive if the ants 'swarm' you. You may be able to kill off a few ants with bombs, but more will come and get you.

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The way you move about in Ant Attack is unusual. The 'm' key turns your body to any of the 4 east, west, north, and south directions. Then pressing the 'v' key makes your person move, and the 'c' key makes him jump. The 'd' key throws a bomb a short distance and the 'f' key throws a long distance. The keys are hard to get used to, but eventually you will get to know them.

Ant Attack is a very good game. If you want to show off a game to your friends, this is it. I highly suggest Ant Attack to all game lovers (it may be a little hard for young children). The price is 6.95 Pounds. TSH

### Helpful Hints

(Spectrum):

Free memory: PRINT 65536-USR 7962

#### Scrolls:

RANDOMIZE USR 3280 scrolls whole page up one line

RANDOMIZE USR 3330 scrolls whole page up to first line

RANDOMIZE USR 3652 clears bottom 1/2 of screen

Cursor: POKE 23617,236 prints '?' as the cursor for input prompts.

Protections: POKE 23659,0 disables 'break' key and program can't produce reports

Neat Method: 1 LET A=PEEK 23637+256\*PEEK 23638: POKE A, 0: POKE A+1,0) 2 REM !!!!!!!LINE 0!!!!!!

NEW: POKE 23755,100 makes listing disappear  
POKE 23755,0 makes it come back

Border: RANDOMIZE USR 1331 makes an "exploding" border

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## HARDWARE REVIEW

By Cherie Hewitt

### SPECTRUM Conversion Kit

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1780 N. DuPont Hwy, #17

Dover, Delaware 19901

\$19 plus \$3.00 shipping and handling  
(302) 734-0179

About a month ago I received a golden flyer from Pheonix Enterprises advertising a product that they claimed would allow me to run Spectrum programs. Needless to say, they had my attention. I had already heard of Doug Dewey's emulator board, but decided that was more than I wanted to invest at the time.

So I got on the phone and called them and talked to a Mr. Jim Payne. Yes, they did sell the kit, but no it didn't plug into the cartridge port. You had to open the computer. I wasn't too thrilled with this, but he explained that the kit was actually a simple micro chip that plugs into one of the sockets already occupied by the current ROMs.

He explained that they didn't offer it on a board since that ran costs up and they wanted it to be as cheap as possible. Besides, it really isn't that hard to change the chips.


So I gave them my charge card number and was told that there could be up to a 4 to 6 week wait due to high demand and supply problems. I said okay, no problem. Two and a half weeks later I got my package from PHEONIX.

The package contains only a microchip and instructions on how to install it. Mr. Payne was right, all that was needed was to remove the seven screws from the case and gently lift a chip out. Then you plug in the new chip and Viola! you have a Spectrum (or an almost Spectrum anyway).

All in all it was a pretty painless (no pun intended) operation. As a matter of fact, I now leave the screws out and changing the chips is just as easy as plugging one of my TS cartridges. I have several Spectrum programs that I got from Pheonix (they have well over 30 titles) and they all run without a hitch. My 2050 modem and software run on the converted 2068 and I now use the new chip over 80% of the time. You lose the STICK, SOUND, ON ERR, FREE, and RESET commands; but all of these can still be obtained with machine code on the converted 2068. The OUT command for 64 columns even works! Pheonix will be marketing ZX Microdrives this fall for use with the chip (they won't work without it.), and even my 2040 still works.

To wrap this up, Pheonix Enterprises has given new life to my 2068 computer. They have given me the ability to run Spectrum software and they even will help me get the software I want. They have delivered what TIMEX had only promised and I am greatly pleased with their service.

I heartily recommend Pheonix's answer to our problem. The price is right, the service is good, and the benefits are FABULOUS! TSH



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**TALKING TS1000 (16K):** Computer pronounces memory bytes in hex or decimal. Use it to check machine code or data without watching TV screen. Comes with program for recording sounds into computer memory and playing back at different speeds. NO HARDWARE NEEDED. \$9.95 cass.

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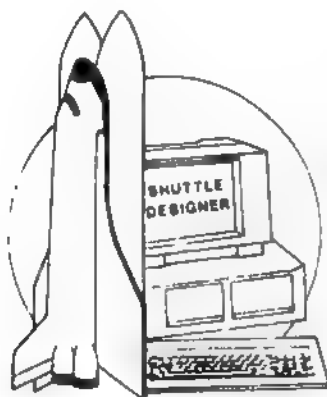
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## Bank Switching cont.

Enter the following machine code at a convenient location (for example, above RAMTOP or in the 8-16K block as below):

```
8192 237 75 130 64 LD BC (16514)
```

```
8196 201 RETURN
```

Now enter PRINT USR 8192 and return. The result shows that BC register pair contains the decimal integer 9000. Now add the additional instructions:

```
8196 205 32 21 CALL STACK-BC
```

```
8199 205 219 21 CALL PRINT-FP
```

```
8202 201 RETURN
```

Enter RAND USR 8192 and the same result (9000) is printed — the two-byte integer is converted to floating point, placed on the stack and then printed.

### EXAMPLE 2

In this example a string of decimal characters will be converted into a floating-point number and then printed.

Enter a REM statement with any number less than 65535 followed by an asterisk. For example:

```
10 REM 9000*
```

The machine code is:

```
8192 33 130 64 LD HL 16514
```

```
8195 34 22 64 LD (CH_ADD) HL
```

```
8198 126 LD A (HL)
```

```
8199 205 217 20 CALL DEC-TO-FP
```

```
8202 205 167 14 CALL FIND-INT
```

```
8205 201 RETURN
```

Enter PRINT USR 8192 and the number in the REM statement will be printed. Instead of calling FIND-INT, call PRINT-FP and use RAND USR 8192. The result will be the same. Use of the single byte routines limits the size of the integer to 255 — larger numbers will result in the error report B. Just for interest, using PRINT-FP, try a string such as 1E2 or even 1.2E-2 in the REM statement.

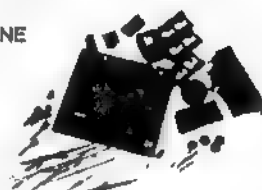
Next month we will construct a directory.

## The HUNTER Board

### Add Memory that won't Forget!

DESCRIBED IN JULY/AUGUST 1983 *Radio Electronics*

- ✓ ADD YOUR OWN SYSTEM UTILITIES
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What a super product! conceived and executed very nicely and with quality components (SYNTAX QUARTERLY Winter 82)

For versatility this is even better than an EPROM ranks quite high on the list of "must-haves" (SYNC Magazine Mar/Apr 83)

Provides the user with instant software an extremely versatile memory extension (Z-WEST June 83)

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|------------------------------------|---------|
| Complete kit with one 2K 6116LP-3  | \$32.95 |
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Send check or money order to the address below

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## Attention Technical Types: SUM\* is here!!!

SUM

\*Small User's Math is a compendium of numerical programs for the small system user by T-S Horizon columnist K.D. Lewis. It contains

## Powerful Algorithms

to handle first and second order differential equations; matrix eigenvalue/vector solution; curve fitting and cubic spline routines; determinants, matrix inversion; Laplace/Poisson equation; the heat or molecular diffusion equation; and more!

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**Order SUM today!**

# SPEED. REDEFINED

AN UNEQUALED EVOLUTION IN 2068 COMPUTING.

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In order to extract the maximum efficiency from the disk, a whole new operating system had to be devised; the result: **SP-DOS**.

## SP-DOS

offers these operating features:

- Loads 32K per second!
- Stores 820K per disk
- Occupies only 4K ram
- Compatible with most software

Super support!—a whole new generation of Disk Software:

- Tasword II (Word Processing)
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- Masterfile (Database)
- Omnicalc II (Spreadsheet)
- Devpac (Assembler)

Language Support: • Basic

• Disk Pascal • "C" Language Compiler

The **SP-DOS** system allows you to use all the Timex cassette commands such as: • Save " " • Load " " • Save Data " " • Load Data " " • Save Screen\$ " " • Load Screen\$ " "

• And all the Micro Drive Commands

Drives that may be used include

Qume, Tandon, MPI, Teac, Shugart etc

Drive #1 is double sided, Quad density, 150 tracks. Drives

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The **Millennia K** interface only \$200.00

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Orders are now being taken however, due to tremendous demand for the **Millennia K** interface system, orders will be on a strict first come, first serve basis. Reserve your system today.

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# T-S NEWS

## LOOK BEFORE YOU LEAP

With the decrease of support and a lack of availability of the Timex computers, many Sinclair followers have been looking forward to the U.S. introduction of the Sinclair Quantum Leap (QL). While some reports of disappointment with the new computer have been filtering in from England (where the QL was finally released earlier this year), many of us have been optimistic. However, the September issue of BYTE features the closest thing to an in-depth review that we have yet seen, and the news is not good.

London computer reviewer, Dick Pountain reports problems with the microdrives, operating system, SuperBASIC, the keyboard and more. His biggest complaint was with delivery delays in Great Britain. Sinclair began taking orders in January 1984, promised delivery in 28 days, had shipped only 300 machines by May, at which time the waiting list was around 13,000.

He calls the keys "dead and unresponsive." The drives in the unit he examined, had a friction problem which destroys the micro-tapes rapidly. (Sinclair claims to have this problem solved now.) The QL is supposed to be multi-tasking, but Sinclair has not perfected this yet. As for SuperBASIC, he says its graphics are poor, and the number handling isn't good enough for business usage.

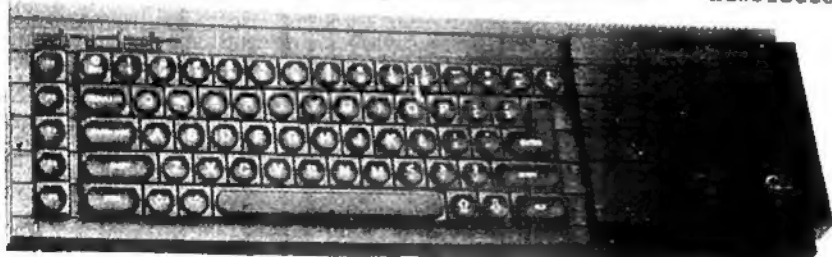
Hopefully by the time the QL is released in the U.S. the microdrive problems will be fixed, the operating system (QDOS) will be

complete, and there will be an alternative to SuperBASIC (unless it is vastly improved). And hopefully it won't be another year before we get a chance to get one.

ITEM: The T.S. National Users Network is a new concept for Timex users. The main feature is the "TS2068 User's Guidebook", a cassette that is mailed monthly to members containing a listing of products available for Timex users. They also maintain a database of user groups, newsletter, BBSs, known Timex users that can be accessed by members. Network members also receive a free game and 10% discount on certain merchandise. The yearly fee is \$30.00. For a sample copy of the Guidebook (TS-2068 only) send \$5.00 to T.S. Services, P.O.Box 14214, Red Bank, TN 37415. (615)877-6328.

ITEM: In T-S Horizons #5 we listed several publications which still support the Timex and Sinclair lines of computers. As editor Bo Barry wrote to remind us, we neglected to mention QZX, a journal for amateur radio enthusiasts who use a ZX81, TS1000, TS1500, or TS2068. The July issue contained information on an RTTY that requires no interface, a logger program, schematics for a real-time hardware clock, a look at the Sinclair QL from a ham radio viewpoint, and more. A subscription is \$12.00/year, from QZX, 2025 O'Donnell Drive, Las Cruces, NM 88001.

ITEM: The Triangle Sinclair User Group, 206 James Street, Carrboro, North Carolina 27510, is offering back issues of their very informative newsletter (4 in all) for \$5. These newsletters include articles by John Oliger, Dick Scoville, and others, not published elsewhere.





# 21st CENTURY ELECTRONICS

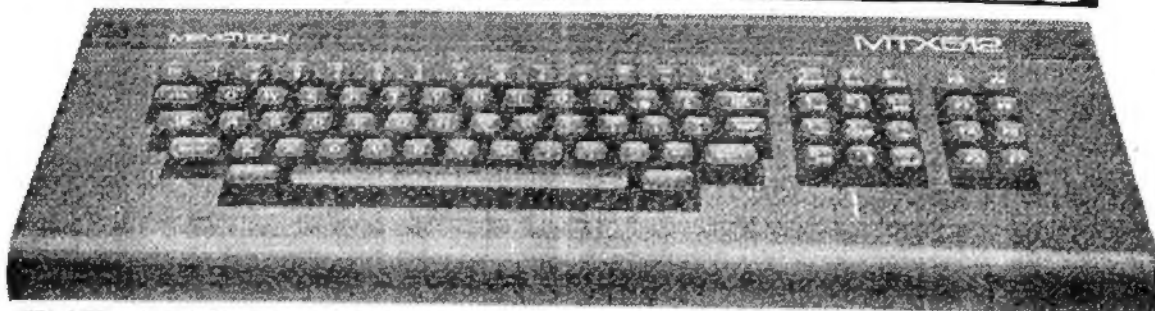
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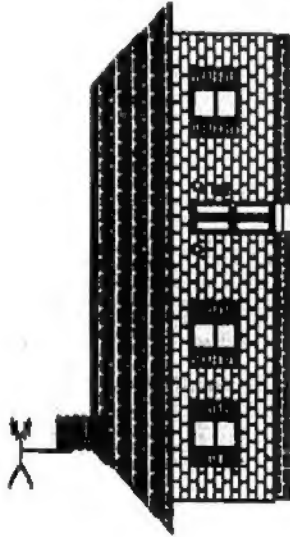
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NEWS



## MULTI-DRAW 2068

The two pictures on the left were made using MULTI-DRAW 2068 by Gary E. Ward.

This program is by far the finest drawing programs we've seen for the TS2068.

This program will allow you to draw on the screen with only the use of the joystick!

Turn on or off any pixel(s) at will - then output your masterpiece to either the

TS2040 printer, or a full size dot matrix printer - in two different sizes! Also,

in the large size print, you may choose to print out your screen in tones of gray

to indicate different colors that were used. Uses for MULTI-DRAW 2068 include:

1. Design game backgrounds
2. Design advertising layouts
3. Design electronic circuits schem.
4. Circuit board layouts
5. Brochure covers
6. Pictures, or just doodling

The magnify screen is a great help for turning off/on pixel(s) - this will give you an instant blow-up of the 4 x 3 character area around your cursor.!

The following commands can be executed by the use of the stick:

DRAW COLOR BIG PRINT SMALL PRINT  
GRAY PRINT SAVE PROGRAM LOAD PROGRAM  
SAVE SCREEN\$ LOAD SCREEN\$ BASIC  
CLEAR SCREEN MAGNIFY

Very easy to learn and to use --

screens can be merged to your own

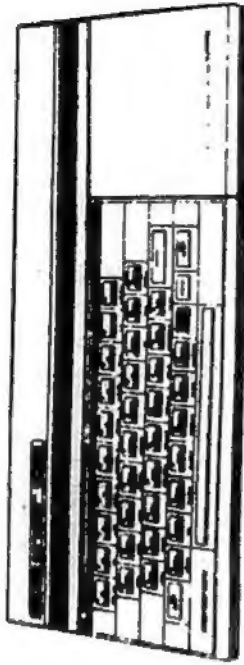
program of course for games designers.

There are 28 pre-defined graphics

characters (that you can quickly and

easily re-define at will with only the

use of the stick. Many more features! \$24.95



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